

DOE OFFICE OF INDIAN ENERGY

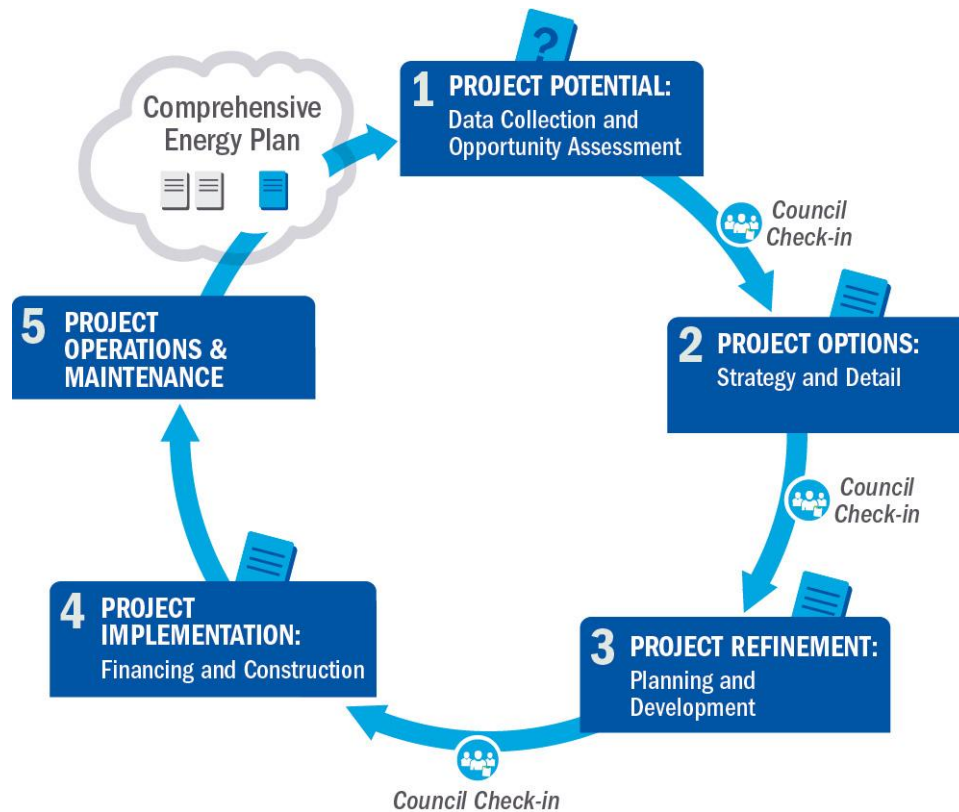
Step 2: Project Options

Narrowing project options, selection, ownership through pros and cons

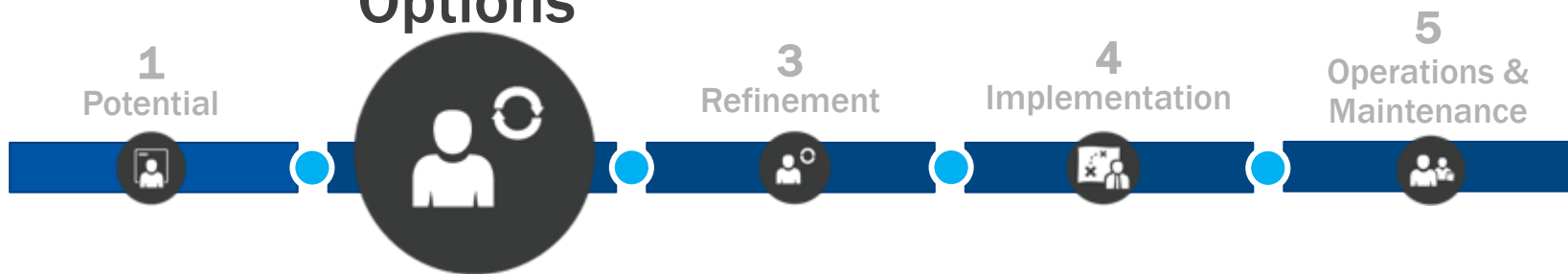


U.S. DEPARTMENT OF
ENERGY

Office of
Indian Energy



2 Options



■ Key Concepts

- Levelized Cost of Energy (LCOE)
- Business Structures for Tribes
- AEA Grants and Loans
- Tax-Equity Partnership
- Risk and Uncertainty
- Roles of the Tribe

In-depth information on each key concept available in Advanced Courses

About the Speaker

Paul Schwabe

- Renewable energy finance and policy analyst at the National Renewable Energy Laboratory (NREL)
- More than 12 years of experience within various sectors of the energy and finance industries
- Financial and technical advisor to the U.S. Department of Energy, the U.S. Army, Consolidated Edison Co., and the California Public Utilities Commission





LEVELIZED COST OF ENERGY



■ Key Concept: Levelized Cost of Energy (LCOE)

- Measures *lifetime costs* divided by energy production, captured in \$/MWh or ¢/kWh
- Calculates *present value* of the total cost of
 - Building
 - Operating a power plant over an assumed lifetime
- Allows the comparison of different technologies (e.g., wind, solar, natural gas) of
 - Unequal life spans
 - Project size
 - Different capital cost
 - Risk, return, and capacities

Levelized Cost of Energy (LCOE)

Critical to making an informed decision to proceed with the development of a project.

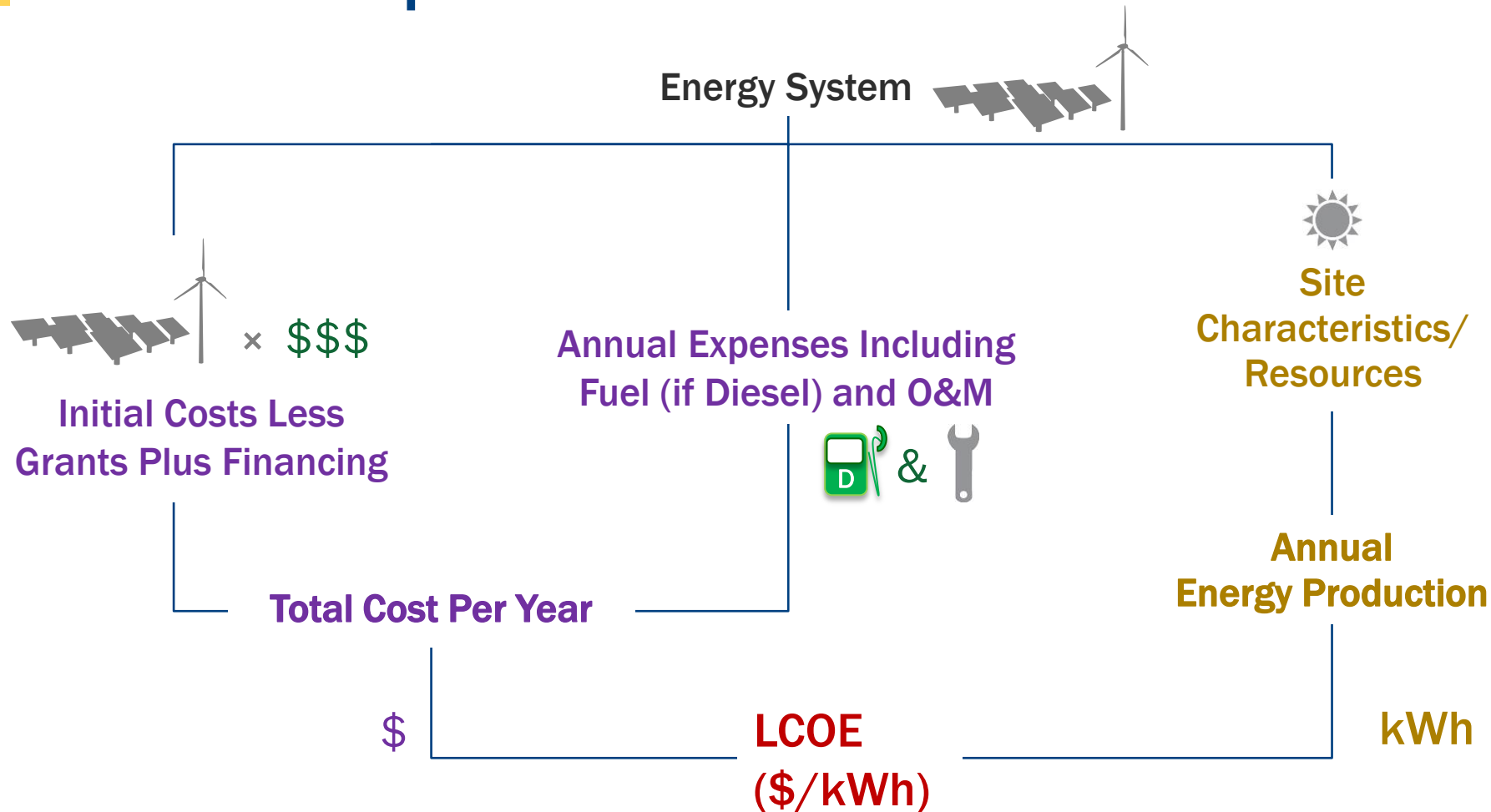
LCOE Calculator:

nrel.gov/analysis/tech_lcoe.html

Lifetime Costs:

- Financing
- Building
- Resources (sun, wind, biomass)
- Operating Expenses
- Energy Production

LCOE Concept



Adapted from European Wind Energy Association, "Economics of Wind Energy,"

http://www.ewea.org/fileadmin/ewea_documents/documents/00_POLICY_document/Economics_of_Wind_Energy_March_2009_.pdf

■ Using LCOE

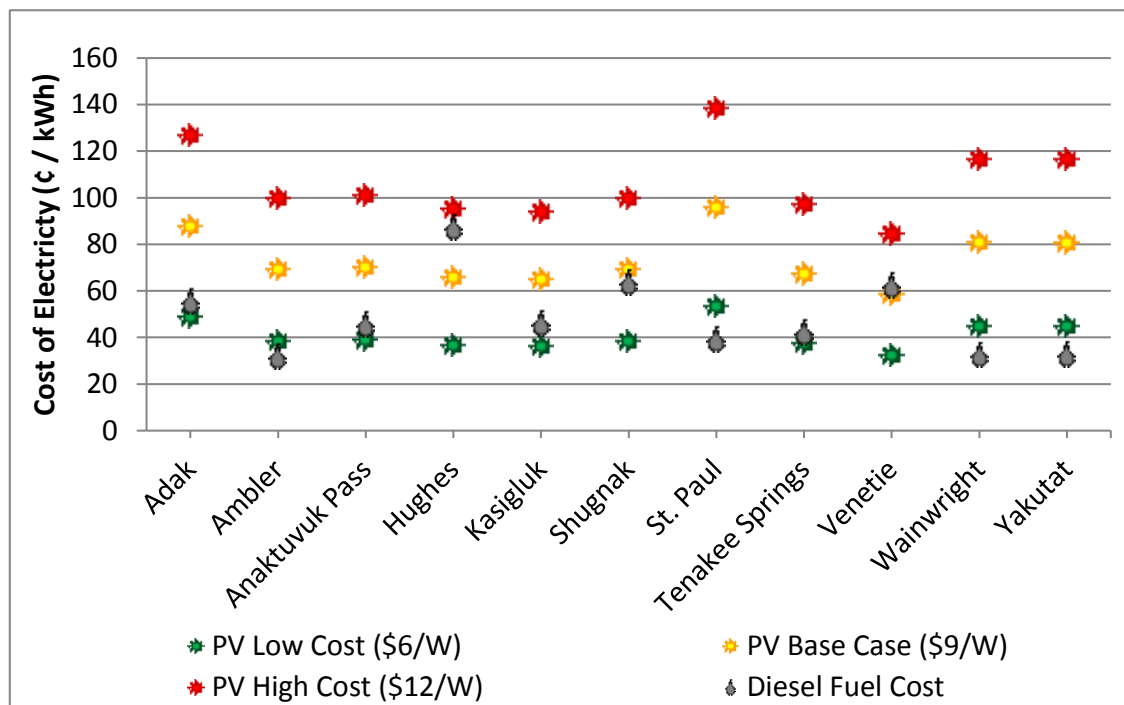
Calculating and comparing LCOE can:

- Measure value across the longer term, showing probable life-cycle costs
- Highlight opportunities for Tribes to develop different scales of projects (facility, community, or commercial)
- Inform decisions to pursue projects on an economic basis, compared to utility rates

Most renewable energy projects have zero fuel costs (with biomass being the possible exception)

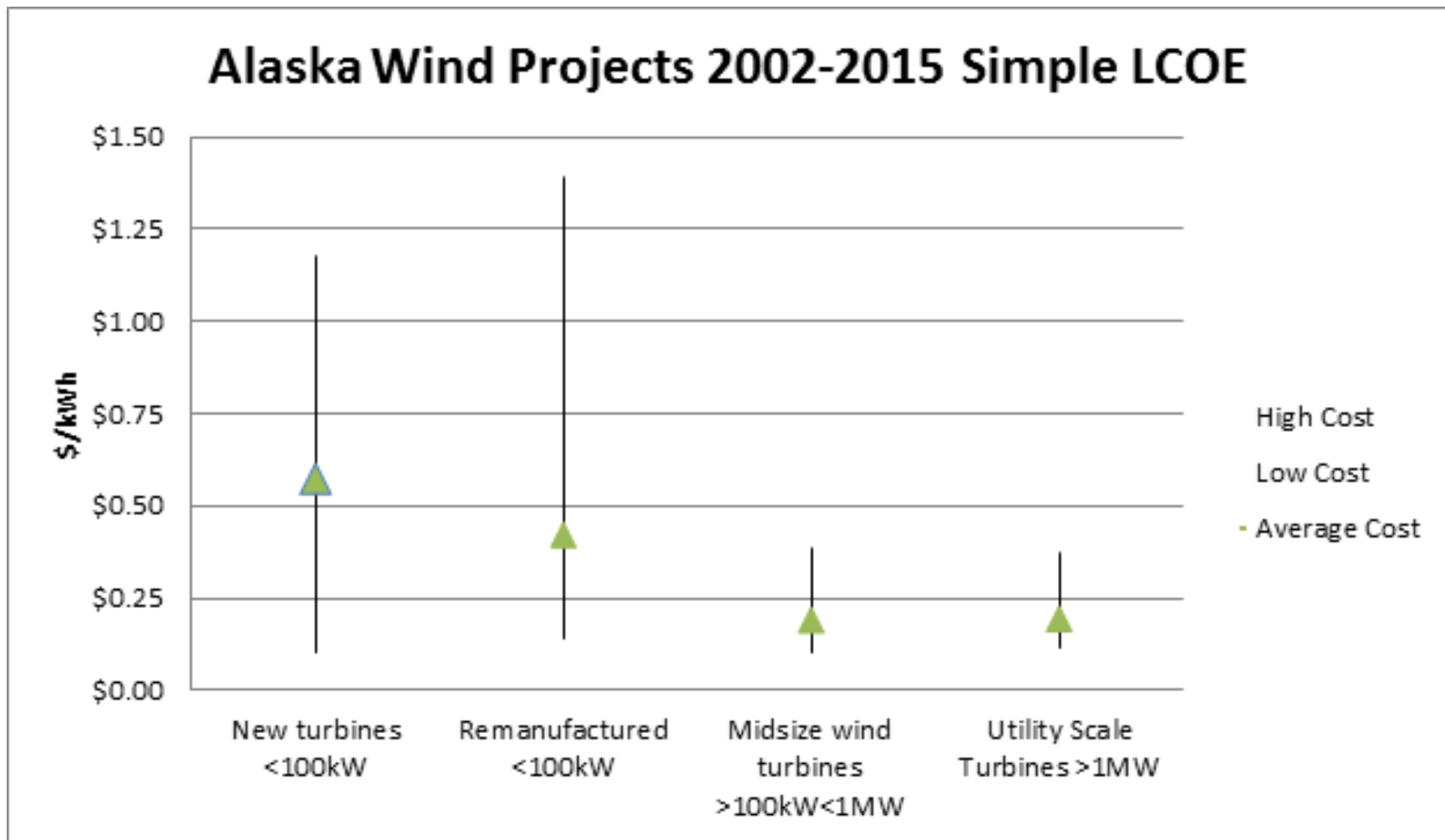
Comparison of Solar PV Costs to Diesel Fuel Costs

- Solar PV can range in costs and can be cost competitive (not factoring in PCE) in certain villages
- Requires combination of relatively strong (for Alaska) solar resources and high diesel fuel costs



LCOE for Wind Energy in Alaska

A wide range of estimated wind LCOE for a variety of wind turbine types utilized In Alaska:





TRIBAL ROLES



Potential Team Members

- **Village Members**
 - Leadership, staff, community members
 - Attorneys, engineers, professionals
- **Developer**
 - Business managers, engineers, permitting specialists, investors, banks, attorneys, accountants, power marketers, procurement specialists, communications, public relations, government relations, corporate finance, project finance, construction managers, O&M specialists, asset managers, etc.
- **Utility**
 - Engineers, attorneys, planning specialists, operations specialists, regulatory specialists, finance, accounting, public relations, communications, systems operators, construction and field personnel, maintenance and emergency operations, etc.
- **Government**
 - Village government, federal, state, local entities, regulating bodies (public utilities commission), Bureau of Indian Affairs, DOE, Federal Energy Regulatory Commission, etc.

The Role of the Project Champion



Village Role Options



* Also called Tribal Host

Village Role Options

Role	Opportunity	Constraints	Comments
Resource/ Land Owner	Land rent/royalty, taxes. Low risk, known reward, consistent income.	Limited project control. Must provide site access.	Limited upside potential, limited risk
Off-Taker/ Energy User	Village purchases or uses all power on-site. Could include an “on-site” provider; security.	Limited investment, economic development for on-site projects	Must have demand to use power; still requires utility interconnection agreement (if on the grid). Med risk.
Project Operator/ O&M	Control and self-determination of project; potential for profits (and losses) is minimal	<ul style="list-style-type: none"> Investors require experience Only consider as a new business (multiple projects in a portfolio) villages investing \$ may not want this high risk/return investment 	<ul style="list-style-type: none"> High risk, complex villages may be best served by outsourcing A project pipeline/portfolio mitigates some risks
Lender/ Debt Provider	Participate financially in project (e.g., cash or NMTC with lower risk	<ul style="list-style-type: none"> Requires ready capital May be cost-prohibitive to document and manage a single debt transaction (multiple more cost-effective) 	<ul style="list-style-type: none"> Med-risk, more complex Requires lending knowledge Option for Villages with limited lands, lots of \$
Equity Investor/ Gen. Owner	Provide cash or NMTC for project development. Less capital than commercial-scale.	Higher risk than debt lending. Requires ready capital, or unique source of capital that provides market advantage (like NMTC).	<ul style="list-style-type: none"> High risk, more complex Competes with other investments Option for Villages with limited lands, lots of \$
Project Developer	Self-determination of project; potential for profits (and losses) is highest. Villages with \$ don't need investors.	<ul style="list-style-type: none"> Investors require experience Only consider as a new business (do multiple projects for diverse portfolio) Villages investing money may not want this high risk/return investment 	<ul style="list-style-type: none"> High risk, complex Villages may be best served by outsourcing A project pipeline/portfolio mitigates some risks

The background image shows three wind turbines on a grassy hill. A thick layer of white mist or fog is rising from the base of the turbines, partially obscuring the lower parts of the hills. The sky is a clear, pale blue. A large, semi-transparent blue rectangular box is positioned in the lower half of the image, containing the text 'BUSINESS STRUCTURES' in white, bold, sans-serif capital letters.

BUSINESS STRUCTURES



Importance of Choosing the Right Business Structure

- **Protect tribal assets**
- **Preserve tribal sovereignty**
- **Minimize potential liability**
- **Collaboration of funding sources**

DOE Finance Workshop
September 2013



Photo by NREL #28041

Business Structure Options for Tribes

- Tribal government entities
 - Unincorporated instrumentalities
 - Political subdivisions
- State law entities
 - State law corporations
 - Limited liability companies (LLCs)
- Joint venture
- Section 17 corporations
- Tribally chartered corporations



NREL Photo #07958

Business Structure: Tribal Government Entities

Option 1: Unincorporated Instrumentalities

Advantages

- Easy to form
- Management is centralized
- Not subject to federal income tax
- Same privileges and immunities as tribal government

Disadvantages

- Politics and business are not separated
- Assets and liabilities of the enterprise not separated from governmental assets
- May preclude equity ownership by outside investors

Option 2: Political Subdivisions

Advantages

- Exempt from federal income tax
- Retain sovereign immunity
- May issue tax-exempt bonds
- Ability to form a corporate board

Disadvantages

- Timely and costly to form the entity
- Not as much flexibility as corporations and LLCs
- May deter certain business partners

Source: Office of Indian Energy & Economic Development 2008

Business Structure: Section 17 Corporations

Tribes can form corporations under Section 17 of the Indian Reorganization Act of 1934

Advantages

- Same privileges and immunity as the tribal government, including tribal sovereign immunity
- Separates the assets and liability of the corporation from tribal asset
- Not subject to federal income tax

Disadvantages

- Lengthy timeline to obtain a corporate charter
- Corporation must be wholly owned by a Tribe
- Example of Section 17 Corp: S&K Technologies, Inc.
 - Environmental restoration
 - Stream channel reconstruction
 - Native plant re-vegetation
 - Civil construction



Tour of the Ponnequin Wind Farm. Photo by NREL 09827

Business Structure: Tribally Chartered Corporations

- Formed by tribal ordinance or tribal corporation code
- Must select a name and draft articles of incorporation
- Best utilized to operate on reservation as an arm of the tribal government
- Example: Ho-Chunk, Inc.
 - Information technology
 - Construction
 - Government contracting



Rooftop PV installation on the Forest County Potawatomi Tribe administration building.
Photo from Forest County Potawatomi Tribe, NREL 20107

Business Structure: State Law Entities

State Law Corporations and LLCs

Advantages

- Quick and easy to organize
- Familiar to lenders and potential business partners
- Can be used to acquire or merge with an existing state-law entity

Disadvantages

- Subject to federal income tax
- May not issue tax-exempt debt



Weather Dancer 1 wind project in Alberta, Canada. Photo from Piikuni Utilities Corporation, NREL 13792

Business Structure: Joint Venture – LLCs or Limited Partnerships

Advantages

- Acquire energy project development expertise
- Secure project financing
- Enjoy benefits of federal incentives (e.g., tax credits)

Disadvantages

- Likely loss of sovereign immunity for the joint venture entity
- Inability to qualify for certain kinds of financing



7.1 kilowatts of residential solar PV

NREL Photo #18691

Options and Liabilities (Risk)

Business Structure Option	Simplicity and Quick Formation	Shield Tribal Assets from Business Liabilities	Avoid Federal Income Taxes	Separate Business from Tribal Control	Ability to Secure Financing
Tribal Instrumentality	●		●		
Political Subdivision			●		
Section 17 Corporation		●	●	●	
Tribal Law Corporation		●		●	
State Law Corporation		●		●	●
LLCs/Joint Venture		●		●	●
LLC (only if Tribe is sole member)			●		



PROJECT FINANCING





■ Alaska Energy Authority Financing Tools

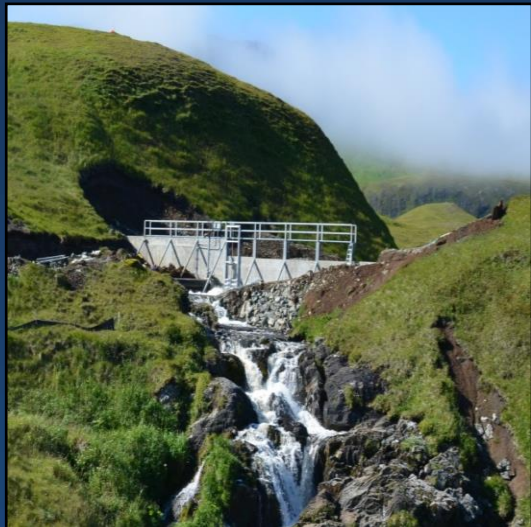
Grants

- Renewable Energy Grant Fund
- Emerging Energy Technology Fund
- Rural Power System Upgrades (RPSU)
- Bulk Fuel Upgrades
- Village Energy Efficiency Program (VEEP)
- Commercial Building Energy Audit

Loans

- Power Project Fund

Renewable Energy Grant Fund



Atka: Hydroelectric



Anchorage: Landfill-Gas-To-Energy Project

- Grant program for renewable energy projects across Alaska
- Places Alaska at or near the forefront of the nation in funding renewable energy
- Displaces volatile-priced fossil fuels through heat recovery, hydro, wind, geothermal, biomass, solar, wind, and transmission projects
- 251 projects approved totaling \$227.5 million
- Based on annual appropriations

Community Contact

- Annual application process, **JULY**, internal review and RE Advisory Committee
- Sean Calfa, scalfa@aidea.org, 771-3031

Power Project Fund



*Cordova: Humpback Creek
Hydro*

- Low-interest loans to upgrade or develop small-scale electric power facilities (terms and rates vary)
- Includes bulk fuel storage, transmission and distribution, waste energy, energy conservation, energy efficiency and alternative energy facilities and equipment

Community Contact

- State assistance for a project more than \$5 million requires Legislative approval
- AEA application process
- Cady Lister, clister@aidea.org, 771-3039



*Chena Hot Springs:
Geothermal*

Tax-Equity Partnerships

- Tribe can benefit from tax-equity incentives without being taxable
- Tribes can partner with third-party tax investors and/or developers to gain this incentive/advantage
 - Recent IRS private letter ruling supports tribal partnerships with third-party tax equity
 - Even with IRS ruling, the Tribe needs capital to build a large renewable project; less is needed for smaller projects
- Tax incentives such as a Modified Accelerated Cost Recovery System (MACRS) and either production tax credit (PTC) or income tax credit (ITC) can represent up to half the project value, or reduce project's capital costs by ~50%
- Tribe benefits from the renewable project by either reducing electricity costs or offering a more competitive price for energy and renewable energy credits (RECs) from the project to a utility

Challenges of Tax Credits and Tax-Equity Finance

1. Tax credits cannot be used efficiently by entities without significant tax liability
2. Value of the credit is diminished through transaction costs and cost of tax-equity finance
3. Limited pool of investors and complexity of structures makes tax equity a particularly expensive source of capital
4. Investors generally want large projects, or portfolio/series of deals so it is worth it

■ Tax Equity Partnerships in Alaska

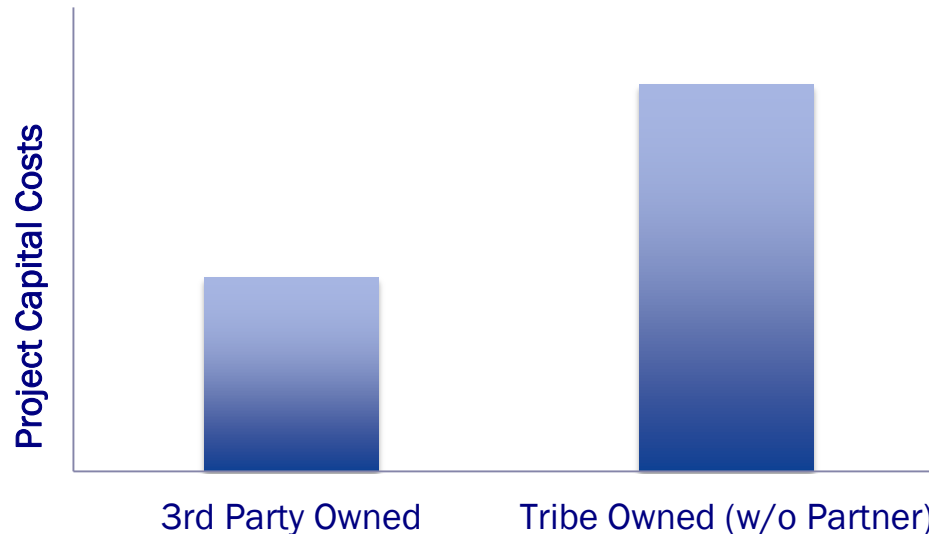
- Tax equity partnerships enable nontaxable tribal governments and Alaska Native corporations with insufficient tax liabilities to fully monetize the tax benefits available
- All rely upon assigning project ownership to an investor with sufficient tax liability to capture available tax benefits
- In Alaska projects typically includes a combination of government-sponsored and private funding

■ Tax Equity Partnerships in Alaska (Continued)

- Tax status, source of capital, project terms, and ownership interest are among the factors to be considered when selecting the optimal financing structure
- Tax credits and accelerated depreciation are by far the most powerful government-sponsored drivers of renewable energy project development in the United States, as they attract the private capital necessary to ensure a project's economic viability
- There are opportunities for tribal governments and Alaska Native corporations to participate in renewable energy project development, both independently and through tax-equity partnerships

Why Seek a Tax-Equity Finance Partner?

- Tax incentives (MACRS and either PTC or ITC) can represent up to half the project value, or reduce project's capital costs by ~50%



- Tax incentives can help to achieve a competitive price of power, since they are sizable
- Many projects also require state-level incentives in order to be economic

■ Federal Tax Incentives

- Production Tax Credit (PTC)
- Investment Tax Credit (ITC)
- Modified Accelerated Cost Recovery System (MACRS) and bonus depreciation

■ Production Tax Credit (PTC)

- Generally, 10-year tax credit for power produced
- 2.3¢/kWh for wind, geothermal, and closed-loop biomass technologies
 - PTC value is adjusted for inflation annually
 - 1.1 ¢/kWh for other technologies
- Requirements on ownership and third-party sales (e.g., prohibits leasing)
- Project must “*start construction*” before 1/1/2014 to qualify (see IRS for starting construction qualifications)

For more information on the production tax credit, see:

http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US13F&re=1&ee=0

■ Investment Tax Credit (ITC)

- One-time tax credit worth either 30% or 10% of project's eligible tax basis (by technology)
- No owner/operator requirements (i.e., enables leasing financing structures)
- Recapture and normalization limit range of project owners, investors, and ability to sell project within first six years of operation
- Property must be “*placed in service*” before 1/1/2017 to qualify

For more information on the investment tax credit, see:

http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US02F&re=1&ee=0

Depreciation

- **Modified Accelerated Cost Recovery System (MACRS)**
 - Allows for depreciation of assets over 5 full years (instead of lifetime)
 - If used in conjunction with ITC, depreciable basis is reduced by half the value of ITC (meaning 85% of eligible costs are depreciable)
- **Bonus Depreciation**
 - Currently, allows for 50% depreciation in first year
 - Expired 12/31/2013
 - Bonus depreciation can be difficult to utilize fully as it requires large tax liabilities in the first year of a project (particularly large ones)

MACRS Depreciation Schedule

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
MACRS	20.00%	32.00%	19.20%	11.52%	11.52%	5.76%
MACRS + Bonus	60.00%	16.00%	9.60%	5.76%	5.76%	2.88%

For more information see http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US06F&re=1&ee=0

Comparison of Tax Incentives

	PTC	ITC	Accelerated Depreciation
Value	Tax credit of 2.3¢/kWh or 1.1 ¢/kWh, depending on technology	Tax credit of 10% or 30% of project costs, depending on technology	Depreciation of eligible costs (not all project costs qualify)
Select Qualifying Technologies	<ul style="list-style-type: none"> • Wind • Geothermal • Biomass • Hydro 	<ul style="list-style-type: none"> • Solar • Fuel cells • Small wind • Geothermal 	Depreciation can be taken with either PTC or ITC
Basis	Energy produced over 10-year period. Can be combined with depreciation, but not ITC	Eligible project cost. Credit taken once the project is placed in service. Can be combined with depreciation, but not PTC	MACRS: 5-year depreciation schedule Bonus: 50% first year accelerated depreciation on equipment
Expiration	Start construction before 1/1/2014	Placed in service before 1/1/2017	MACRS: None Bonus: 1/1/2014

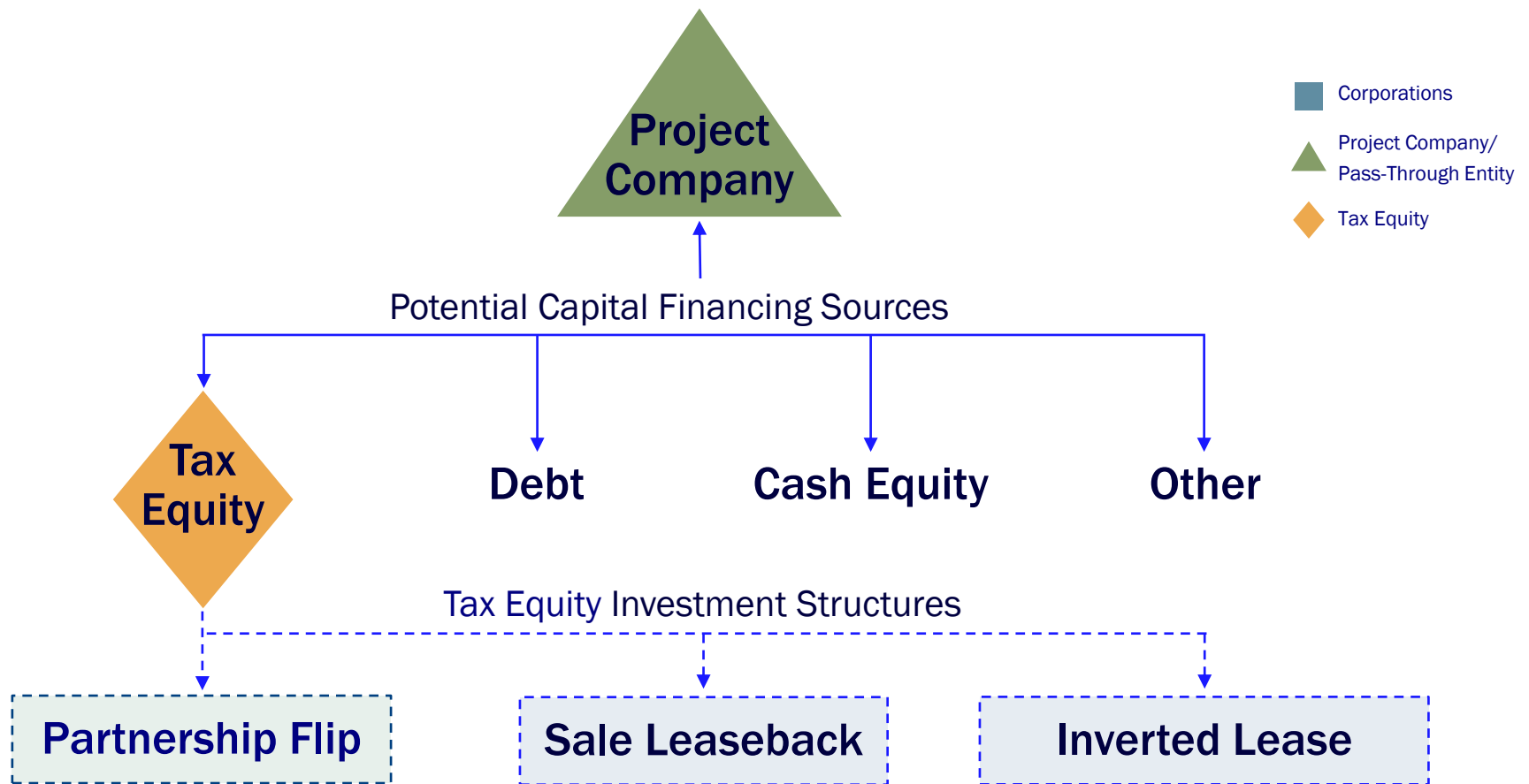


Renewable Project Finance

- **Economics are Dependent on Tax Equity/Other Policy**
 - Governments/nonprofits have no tax appetite
 - Utilities may value RECs to satisfy legal requirements
 - Third-party financing can be one solution
- **Key Contract: Power Purchase Agreement (PPA)**
 - A long-term, financeable commitment to buy project output
 - Generally addresses energy and attributes (like RECs)
 - Allows developer to monetize tax or other policies
 - Finding a power purchaser/off-taker is key for securing capital

Several common financing structures and financing sources are used by the industry to finance renewable energy projects

Capital Structure with Tax Equity



Non-Taxable Government Entity Example

PROJECT: Denver International Airport installed a 2-megawatt solar array to provide up to half of the electricity to power the people mover transit system

MARKET BARRIERS: Cost of electricity, price stability, construction risks

GOVERNMENT ROLE: Sponsor, off-taker

TRANSACTION SUMMARY: MMA Renewable Ventures (MMA) financed and owns the project and sells the electricity it produces to the airport under a long-term PPA

OUTCOME: DIA reduced electricity costs; MMA sells the RECs to Xcel Energy to fulfill its state renewable energy obligation (through 2020). MMA receives a rebate from Xcel, a large tax federal break, and generates revenue from the electricity the array produces

Project Name	Denver Airport Solar Project
Size (DC) Type	2,000 kilowatt; Ground-mount, single-axis tracking
Developer	World Water & Solar Technologies
Owner	MMA Renewable Ventures
PPA Terms	<ul style="list-style-type: none">• 25 years• Fixed-price 6¢/kWh for first 5 years• Buyout option at year 6, or price increases to 10.5¢/kWh

Source: <http://www.nrel.gov/docs/fy10osti/46668.pdf>; and <http://thegreenwombat.com/2007/10/01/denver-airport-goes-solar/>

■ Energy Service Companies (ESCo)

- A long-term energy management partner
- Customer-focused service and communications
- Listen to understand customer needs
- Offer solutions to best address customer needs
- Propose and document the potential ESPC project
- Good faith negotiations to meet mutual needs
- Motivated by financial return from long term revenues

Resources for ESPCs

- DOE FEMP ESPC resources at <http://energy.gov/eere/femp/resources-implementing-energy-savings-performance-contracts>
- Measurement & Verification (M&V) document templates
 - M&V plan
 - Post installation M&V report
 - Periodic M&V report
- Renewable energy screening
- Pre project analysis of cost-effective RE opportunities
 - Solar
 - Wind
 - Biomass
 - Geothermal Heat Pumps

Project Risk – Community-Scale

	Risks	Risk Assessment Post Step 1
Development	<ul style="list-style-type: none"> • Poor or no renewable energy resource assessment • Not identifying all possible costs • Unrealistic estimation of all costs • Incorrect estimation of long-term “community” energy use (energy efficiency first) • Utility rules and ability to offset use with centralized production 	<u>Screened good sites</u> <u>Reduced</u> <u>Reduced</u> <u>Reduced</u> <u>Reduced</u>
Site	<ul style="list-style-type: none"> • Structural (e.g., rooftop solar, wind loading, soil conditions) • Installation safety (e.g., wind tower, hazard for adjacent sites) • Site control for safety/security purposes 	Unchanged Unchanged <u>Reduced</u>
Permitting	<ul style="list-style-type: none"> • Tribe-adopted codes and permitting requirements • Utility interconnection requirements 	<u>Reduced</u> <u>Reduced</u>
Finance	<ul style="list-style-type: none"> • Capital availability • Incentive availability risk 	High risk, unchanged <u>Reduced</u>
Construction/Completion	<ul style="list-style-type: none"> • EPC difficulties • Cost overruns • Schedule 	Assumed low, mitigable, or allocatable
Operating	<ul style="list-style-type: none"> • Output shortfall from expected • Technology O&M 	Assumed low, mitigable or allocatable

Conclusion

- There is a large potential for renewable energy development in Alaska. To date, projects in Alaska have been largely publicly financed, but there is opportunity to expand into private financing to capture more project potential
- Renewable energy development often requires innovative financing structures to fully realize the tax benefits available and typically includes a combination of government-sponsored and private funding

Next Steps

- Evaluate options for sources of capital, tax equity partnerships, project terms, and ownership interest when selecting the optimal financing structure
- Tax credits and accelerated depreciation are by far the most powerful government-sponsored drivers of renewable energy project development in the United States, as they attract the private capital necessary to ensure a project's economic viability
- There are opportunities for tribal governments and Alaska Native corporations to participate in renewable energy project development, both independently and through tax-equity partnerships



THANK YOU

- Questions/comments:
indianenergy@hq.doe.gov
- For more information:
www.energy.gov/indianenergy
- Additional courses: www.nterlearning.org

